

## Appendix B

### STRUCTURAL BUILDING ASSESSMENT

On October 27, 2009, CHA, Inc. performed a visual structural assessment of the buildings located at the Ellington Airport in the Town of Ellington, Connecticut. The assessment included seven facilities of varied construction and occupancy, and number of structures. The purpose of the assessment was to identify structural deficiencies and potential need for rehabilitation. Table B-1 below is a brief description of each structure, with a list of deficiencies and recommendations; Figure 1-1 identifies the location of the buildings. A planning cost estimate is provided for the repairs for each structure listed within the Airport Capital Improvement Plan in Chapter 2.

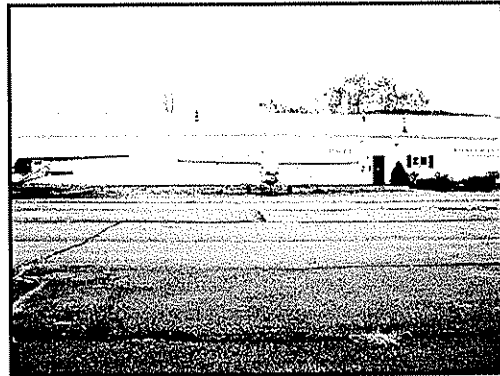
| <b>TABLE B-1 – STRUCTURAL CONDITION SUMMARY</b> |                  |  |
|---|------------------|--|
| <b>Landside Facility</b>                        | <b>Condition</b> | <b>Short-Term Recommendation</b>                         |
| Helicopter Maintenance                          | Fair             | Repair Corrosion & Roof Leak & Install Gutters           |
| Auto Mechanic                                   | Fair             | Repair Corrosion   |
| Aircraft Maintenance                            | Fair             | Repair Corrosion & Dents                                 |
| Office Building                                 | Fair             | Repair Exterior Deterioration                            |
| Skydiving Facilities                            | Fair             | Replace Deteriorated Wood & Install Handrails on Bridges |
| Private Storage                                 | Poor             | Replace Deteriorated Elements & Install Gutters          |
| Private Hangar #1                               | Fair             | Repair Torn Fabric                                       |
| Private Hangar #2                               | Good             | None   |
| Private Hangar #3                               | Poor             | Rebuild Foundation Piers                                 |

#### Scope of Investigation:

The structural condition assessment is based on visual observations of the existing building's interior and exterior surfaces made by CHA during the site visit. The Office Building, Private Hangar #1, and Private Hangar #2 were locked, and it was not possible to access the interiors of these buildings. No drawings, reports, or other information regarding the existing structures was provided to CHA. CHA did not perform any sampling, testing, or calculations to analyze the existing structures.

**Helicopter School/Auto Mechanic Facility:**

The Helicopter School Hangar and Auto Mechanic facilities are both located in the same structure, which consists of a one-story pre-engineered metal building. This building has a sloped roof, and the outside dimensions are approximately 150'-0" x 80'-0". The exterior wall and roof surfaces consist of white colored metal panels. There is an overhead door located at the north gable end wall for access to the automobile repair facility. A hangar door is located at the south gable end wall for helicopter access to the helicopter maintenance hangar. The remaining openings in the building exterior consist of typical windows and single and double doors.



The interior of the helicopter maintenance hangar consists of a large open area with an exposed concrete slab-on-grade where the helicopter maintenance is performed. This area has exposed structural elements and insulation with no architectural finishes on the walls or ceiling. There is a mezzanine in this area where office space is located. The walls, floors, and ceiling of the office space are covered with architectural finishes.

The interior of the automobile repair facility consists of a large open area with an exposed concrete slab-on-grade where automobile repairs are performed. There are many vehicle lifts that are bolted to the slab-on-grade. This area has exposed structural elements and insulation with no architectural finishes on the walls or ceilings. There are several mezzanines that function as office space and storage space. These mezzanines are wood framed and finished with gypsum wall board.

The following conditions were observed at the time of the assessment:

- Evidence of structural deficiencies to the primary and secondary structural members was not observed.
- The exterior surface of the metal roofing has many areas of corrosion.
- The bottom edge of the metal wall siding has corrosion in several areas.
- The bottom edge of the metal wall siding is dented at several areas.
- The bottom edge of one of the exterior man doors is corroded.
- There are no gutters at the roof. Rain water falls from the roof to the pavement that surrounds the building on three sides, and splashes on to the metal wall siding.
- The roof insulation is torn at the roof ridge in the helicopter maintenance hangar.
- There are several minor cracks in the concrete slab-on-grade in the helicopter maintenance hangar. These cracks were painted and do not appear to be formed recently.
- The ceiling tile at the entrance door to the helicopter hangar is stained which indicates a roof leak.
- There are several small holes in the roof insulation in the automobile repair garage.

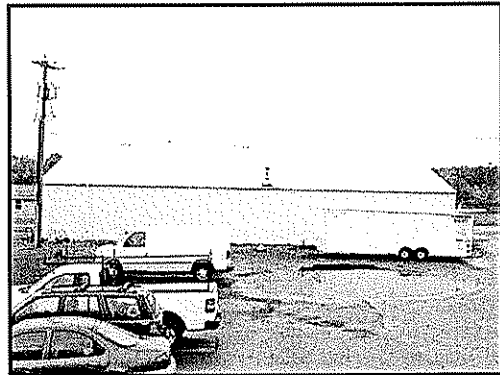
- The wall insulation is torn at several locations at the automobile repair garage.
- The bottom edge of the metal wall panels above the hangar door are corroding.
- The bottom edge of the exterior man door is corroding.

Recommendations:

- The corroded areas of the exterior metal wall and roof panels should be repaired by removing the rust and repainting. Due to the large number of corroded areas on the roof, the entire roof should be repainted. Repainting the entire wall surface is not warranted. Only those areas of the exterior wall panels that are corroded should be repainted.
- Gutters and downspouts should be installed to control roof drainage. Roof drainage should not be allowed to splash on to the exterior wall panels because this will lead to corrosion.
- Exterior metal wall panels that are dented should be replaced.
- The source of the roof leak at the helicopter hangar entrance door should be identified and repaired. The stained ceiling tile should be removed and replaced to match the existing unstained ceiling tiles.
- The torn roof and wall insulation should be replaced with new insulation.

**Aircraft Maintenance Facility:**

The aircraft maintenance facility is a one-story pre-engineered metal building with a sloped roof. The exterior dimensions of this building are approximately 70'-0" x 82'-0". The exterior wall and roof surfaces consist of white metal wall panels. There is a large hangar door with translucent panels at the south end of the building for aircraft access. There is also a door located at the south wall for personnel access to the building. There are no other doors and there are no windows in this building.



The interior space of this building consists of a large open area with a concrete slab-on-grade where aircraft maintenance is performed. At the north end of the space there is a wood framed mezzanine with office space. The upper surface of the mezzanine is used for storage. Insulation lines the interior surfaces of the both the roof and the walls. There are no architectural finishes.

The following conditions were observed at the time of the assessment:

- Evidence of structural deficiencies to the primary and secondary structural members was not observed.
- The exterior surface of the metal roofing has many areas of corrosion.
- The bottom edge of the metal wall siding has corrosion in several areas.
- The metal flashing at the bottom of the wall panels is corroded.

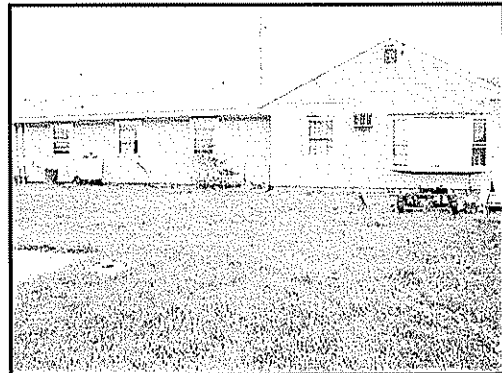
- The exterior metal wall panels are dented at the bottom of the walls. The denting is severe at the west wall where many of the joints between the panels are displaced and out of alignment. This condition may allow water to enter the building.
- There are no gutters at the roof. Rain water falls from the roof to the pavement that surrounds the building on two sides, and splashes on to the metal wall siding
- The steel columns at each end of the hangar door have mild corrosion near the floor. Delamination was not observed.

**Recommendations:**

- The corroded areas of the exterior metal wall and roof panels should be repaired by removing the rust and repainting. Due to the large number of corroded areas on the roof, the entire roof should be repainted. Repainting the entire wall surface is not warranted. Only those areas of the exterior wall panels that are corroded should be repainted.
- Gutters and downspouts should be installed to control roof drainage. Roof drainage should not be allowed to splash on to the exterior wall panels because this will lead to corrosion.
- Exterior metal wall panels that are dented should be replaced.
- The corroded metal flashing at the base of the wall should be repaired by removing the rust and repainting.
- The corrosion on the steel columns adjacent to the hangar door should be removed, and the columns repainted.

**Office Building:**

The office building is a single story wood framed building with a sloped roof with asphalt shingles. The exterior wall finish consists of vinyl siding with painted wood soffits and fascia boards. The exterior windows have wood sashes. The building is "L" shaped, and measures approximately 60'-0" x 32'-0". There is a windsock mounted on a pole that is attached to the roof. The pole is stabilized by guy wires that are anchored to the roof. At the time of the inspection, the only interior space that was accessible was the entry hallway. The other interior spaces were locked.



The following conditions were observed at the time of the assessment:

- The asphalt roof shingles are deteriorating.
- The painted wood fascia boards and soffits are deteriorated. Wood rot was observed in many locations on these members.

- The joints of the vinyl siding were coming apart at several locations. This condition can allow water to penetrate the exterior and potentially cause deterioration of the wood sheathing.
- Many of the wood windows are deteriorating or rotting. The bay window at the west wall of the building is in very bad condition.
- The attic vents at the south gable end wall is deteriorating. A vent was not observed at the north gable end wall.
- Ridge vents were not observed at the roof.
- Vents at the wood soffits are very small and are probably inadequate.
- A rusting propane tank is located against the west wall of the building.

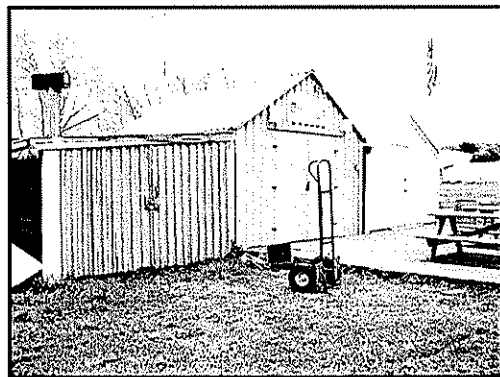
**Recommendations:**

- Replacement of the asphalt roof shingles may be necessary within the next 5 years. A ridge vent should be added to help in providing proper attic ventilation.
- All of the wood soffit boards should be removed and replaced with ventilated vinyl panels to provide adequate attic ventilation. The deterioration of the soffits suggests that deterioration of the wood roof shingles and wood framing members may be occurring. The attic space should be accessed so that an inspection of these members can be performed.
- The interior spaces that were not accessible should be inspected.
- All wood fascia boards should be removed and replaced with aluminum trim.
- The separated joints in the vinyl siding should be repaired.
- All paint should be removed from the wood windows so that they can be repainted to stop the deterioration. If the deterioration is not stopped soon, it is likely that all windows will require replacement.

**Sky Diving Facility:**

The sky diving facility consists of four small shed type structures with three small open pavilions consisting of fabric roof structures supported by metal framing. There are also two small wood bridges that cross a small stream to access this area from the rest of the airport. Two of the shed structures are wood framed with asphalt roof shingles. One of these wood framed structures appears to be used as a small office area. The two metal framed sheds are constructed with corrugated metal wall panels. One of the metal structures has a sloped roof consisting of corrugated metal, and the other metal structure has a mono slope

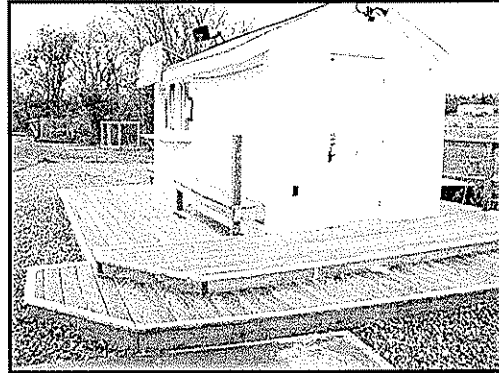
roof in a lean-to configuration. The roof for the lean-to structure and one of the walls appeared to be made from plywood. There is a concrete patio slab at the north end of the sheds, and there is a wood deck at grade at the south end of the sheds. The wood deck was covered with green carpet



material. There is also a grade level wood deck surrounding the wood shed used as office space. All of the enclosed structures were locked and the interiors were not inspected.

The following conditions were observed at the time of the assessment:

- The plywood wall at the lean-to structure is deteriorated and in poor condition.
- The wood roof deck at the south end of the shed structures felt soft and spongy in several areas. The green carpet material is probably trapping moisture against the wood framing and causing decay.
- The southern bridge crossing the stream has no handrails.
- The shed structure used as office space has two different colors of asphalt roof shingles.
- One of the wood framed sheds has vinyl siding which is mold stained at the north wall.
- The paint at the north wall of the metal shed with the sloped roof is failing at the north wall.

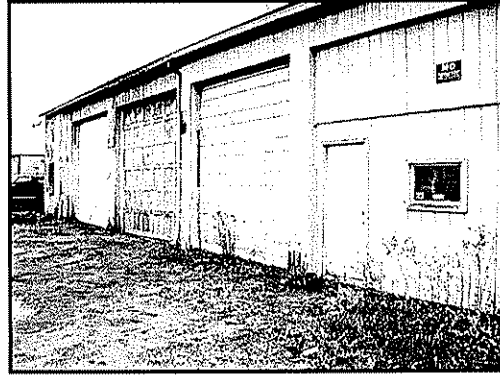


Recommendations:

- The deteriorated plywood at the metal lean-to structure should be replaced with new plywood. The new plywood should either be painted or be pressure treated to resist decay.
- The green carpet material should be removed from the wood deck at the south end of the shed structures. All soft and deteriorated wood deck framing should be removed and replaced with new pressure treated wood.
- Handrails should be installed at the southern bridge crossing the stream. The handrails should be strong enough to resist the horizontal loading required by the local building code.
- The failing paint should be removed from the metal shed with the sloped roof. This building should then be repainted.

**Private Storage Building:**

The Private Storage Building is a one-story wood framed building located at the northwest corner of the airport. It measures approximately 30'-0" x 60'-0", with a sloped roof. On two sides the building has wood siding, and on the other two sides the exterior siding consists of ribbed metal wall panels. The metal wall panels do not appear to be part of the original construction. There are three overhead doors along the east wall of the building.



The interior space has a concrete slab-on-grade, and appeared to be divided into three areas. The large open area has exposed wood roof trusses.

The following conditions were observed at the time of the assessment:

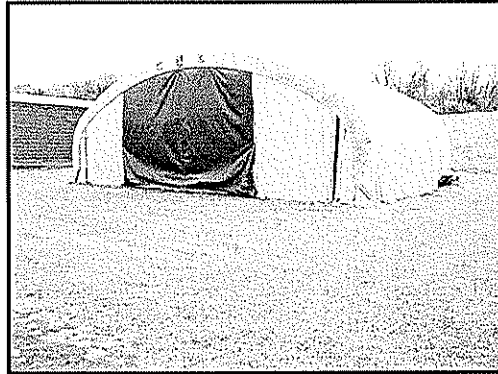
- The roof ridge is very uneven, which indicates that the roof members have experienced large differential deflections.
- The gutter on the east side of the building is pulling away from the roof.
- The asphalt roof shingles are in poor condition.
- The exterior wood siding is in poor condition. The wood siding extends down to the finished grade, and is deteriorating at this location.
- There is very little roof insulation. The roof insulation that does exist is in poor condition and is hanging from the roof structural members.
- It was not possible to inspect the west exterior wall because of the brush and debris that were against this wall.

**Recommendations:**

- Additional study should be performed to determine the cause of the roof deflection. The roof structural members should be accessed with a lift for further study.
- The gutters should be replaced with new gutters and downspouts. Splash blocks should be provided at each downspout.
- The deteriorated asphalt roofing should be replaced.
- The roof should be properly insulated, in addition to the walls.
- The deteriorated areas of the wood siding at the bottom of the walls should be replaced with pressure treated wood siding because the wood siding is within eight inches of finished grade.

**Private Hangar #1:**

Private Hangar #1 is an arch structure consisting of steel arches supporting a fabric skin. There is one opening at the west side of the hangar. The steel arches are embedded in the soil. No foundation piers were observed, and there is no concrete slab-on-grade. The hangar was closed at the time of the inspection, and it was not possible to inspect the hangar from the interior. However, it was possible to observe the interior through a partial opening at the front of hangar.



The following conditions were observed at the time of the assessment:

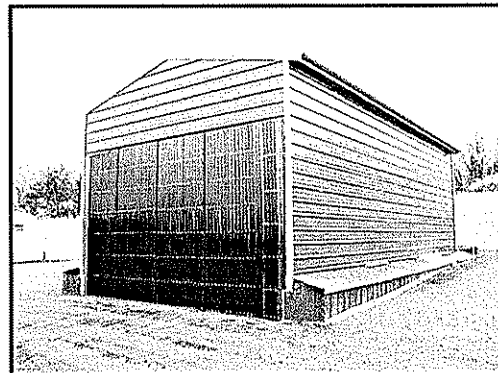
- Evidence of significant structural deficiencies was not observed.
- Several small holes were observed at the top of the fabric covering.

**Recommendations:**

- The holes in the fabric covering should be patched.

**Private Hangar #2:**

Private Hangar #2 is a pre-engineered metal structure with a sloped roof. The exterior wall and roof surfaces consist of metal panels. The hangar was closed at the time of the inspection, and it was not possible to access the interior space.



The following conditions were observed at the time of the assessment:

- None

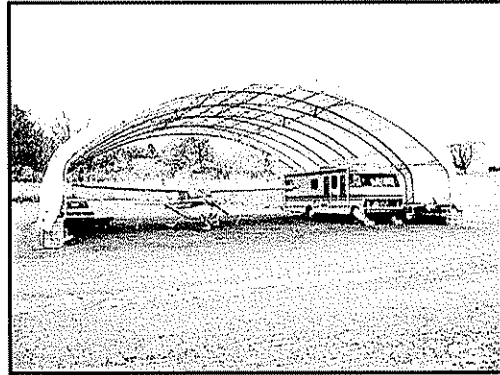
**Recommendations:**

- No structural deficiencies were observed that require recommendations. Regular maintenance should be performed on the hangar to maintain its condition.



**Private Hangar #3:**

Private Hangar #3 is an open-ended steel arch structure with a fabric covering. Each of the steel arches is supported by piers consisting of concrete masonry units (CMU) that are loose laid and strapped together with light gauge steel banding. Each end of the steel arches bear on plywood at the top of the pier. There is also a steel cable tied around the base of the steel arches embedded into the soil. There is no concrete slab-on-grade.



The following conditions were observed at the time of the assessment:

- The CMU piers were constructed without any mortar or grout. The CMU cells that were observable under the plywood bearing plate at the top of the piers were hollow.
- The CMU piers at the south side of the hangar are not plumb and have moved to the south.
- The steel banding strapping the CMU together is rusting. The banding is ineffective at bonding the piers together.
- The plywood bearing plates at the top of the piers are deformed.
- Several of the steel cables anchoring the piers to the soil are loose at the north side of the hangar.
- The arches at the west end of the hangar are loading the piers eccentrically.
- There are several tears and stains at the north end of the hangar.

**Recommendations:**

- The foundation piers are not stable, do not represent good construction practice, and should be rebuilt. If they are rebuilt from masonry, the blocks should be mortared together, and the cores of the CMU should be grouted solid. The piers should be designed by a professional engineer licensed in Connecticut for all loading required by the local building code. The pier design should include the connection of the arch to the pier for all forces required by the local building code.
- The torn fabric should be patched.



Completed By: B. Bidonde  
 Checked By: DJD  
 Project Name: Ellington Airport Visual Structural Assessment  
 Project Location: Ellington, CT

**CHA COMPUTATION**  
 Project 19818 Phase 1001 Org 1203  
 Sheet 1 Of 1  
 Date 12/18/2009  
 Subject Approximate cost estimate - repairs

| Bldg Name             | Description   | Labor     |       | Units | Materials |          |           |
|-----------------------|---|-----------|-------|-------|-----------|----------|-----------|
|                       |   | man-hours | \$/MH |       | \$/Unit   | Quantity | Total     |
| Helicopter/Auto Maint | Remove rust, and repaint entire roof and corroded areas of walls. Replace dented wall panels and install gutters and downspouts.  | 80.00     | 65.00 | LS    | 16000.00  | 1.00     | 21,200.00 |
| Building Sub-total    |   |           |       |       |           |          | 21,200.00 |
| Aircraft Maintenance  | Remove rust, and repaint entire roof and corroded areas of walls. Replace dented wall panels and install gutters and  | 50.00     | 65.00 | LS    | 10000.00  | 1.00     | 13,250.00 |
| Building Sub-total    |   |           |       |       |           |          | 13,250.00 |
| Office Building       | Add roof ridge vent, replace soffits and fascia, repaint windows and repair vinyl siding.   | 40.00     | 65.00 | LS    | 2000.00   | 1.00     | 4,600.00  |
| Building Sub-total    |   |           |       |       |           |          | 4600      |
| Skydiving Facilities  | Replace plywood at shed, repair wood deck, add wood handrails at bridges crossing stream.   | 16.00     | 65.00 |       | 1600.00   | 1.00     | 2,640.00  |
| Building Sub-total    |   |           |       |       |           |          | 2,640.00  |
| Private Storage       | Replace roof shingles and wood wall sheathing, add gutters, ridge vents and new soffits. Does not include structural repairs that may be required from additional analysis. | 80.00     | 65.00 | LS    | 10000.00  | 1.00     | 15,200.00 |
| Building Sub-total    |   |           |       |       |           |          | 15,200.00 |
| Private Hangar #1     | Repair torn fabric  | 4.00      | 65.00 | LS    | 100.00    | 1.00     | 360.00    |
| Building Sub-total    |   |           |       |       |           |          | 360.00    |
| Private Hangar #2     | No repairs are required.  | 0.00      | 65.00 | LS    | 0.00      | 0.00     | 0.00      |
| Building Sub-total    |   |           |       |       |           |          | 0.00      |
| Private Hangar #3     | Rebuild the masonry support piers. Repair torn fabric.  | 80.00     | 65.00 | LS    | 2500.00   | 1.00     | 7,700.00  |
| Building Sub-total    |   |           |       |       |           |          | 7,700.00  |
| Facility Total        |   |           |       |       |           |          | 64,950.00 |
| 20% contingency       |   |           |       |       |           |          | 12,990.00 |
| TOTAL                 |   |           |       |       |           |          | 77,940.00 |

LS = Lump Sum